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**Comments On:
California Alternative Fuels Market Assessment 2006
Full Fuel Cycle Assessment and the Meeting Transcript of the
October 16th Joint Workshop in the Related Matter Below**

October 30, 2006

In the Matter of:

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Docket No. 06-AFP-1

**Informational Proceeding and Preparation)
of the State Plan to Increase the Use of)
Alternative Transportation Fuels)**

**Comments Submitted to:
Docket No. 06-AFP-1
“Alternative Fuels Plan”**

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Introduction:

The Renewable Fuels Association (RFA) appreciates the opportunity to submit comments on the California Alternative Fuels Market Assessment 2006 and the Full Fuel Cycle Assessment. We would also like to thank the Energy Commission and Air Resources Board for extending the comment period to allow stakeholders time to conduct a more thorough review.

The RFA is the industry trade association for the domestic fuel ethanol industry representing over 90% of U.S. ethanol production. Our membership includes 56 ethanol producers and 45 future producers as well as 160 + associate and supporting members.

Today there are 106 producing ethanol plants with a name plate capacity of 5 billion gallons per year. There are 48 plant construction and expansion projects in progress that will add another 2.8 billion gallons over the next 12 to 24 months. There are also dozens of proposed plants that are in various stages of planning and development. With its recent and continued growth ethanol provides the greatest and most immediate opportunity to replace fossil fuels.

Comments on Market Assessment Study:

The California Market Fuels Assessment 2006 lays some very good ground work for the Energy Commission and Air Resources Board to consider. There are, however, a few areas that would benefit from addition, expansion and clarification. These areas are discussed below. Each comment is prefaced by the page number of the assessment to allow for more convenient review.

Section 5: Ethanol

(Page 5-1): The report comments that “The advantages of E85 fueling, emissions impacts, petroleum displacement and impacts on the gasoline pool need to be better understood”. However, a great deal is known, we know that FFV’s are certified to certain emissions standards and can therefore predict emission profiles. We also know that the denatured ethanol portion of E85 contains ~ 78,000 btu / gallon. Consequently we know that 1.5 gallons of ethanol replaces one gallon of gasoline (exclusive of any improvements in FFV technology to take advantage of ethanol’s higher octane and greater thermal efficiency). We also know that E85 would likely replace imported gasoline so there is no major impact on total refinery production and therefore on the gasoline pool.

It should also be noted that the drop in FFV sales in California after 2003 is, in the assessment, attributed to Ford and Daimler Chrysler offering fewer models. In actuality the drop was in part because fewer models were offered in California due to more stringent emissions requirements. FFV sales in the rest of the U.S. increased during this time frame.

(Page 5-4): There is an important omission here. Neither here, nor anywhere else in the report, are the duration of the CAFÉ Credits discussed. They are currently scheduled to expire in 2010. They can be extended to 2013 under current law. However, any extension beyond that point will require new enabling legislation. Also, although the structure of credits is discussed briefly, the impact of FFV selection is not. The current

structure favors deploying FFV technology in less fuel efficient vehicles while recent gasoline price increases may drive consumers to the opposite end of the vehicle fuel efficiency scale.

It should also be noted that the octane of E85 is not 105. It is 97-98 (R+M)² and the energy content is not 82,000 btu / gallon but rather 83,400 to 87,000 (depending on hydrocarbon content).

(Page 5-5): While the timing of an FFV engine can be advanced to take advantage of a portion of E85's higher octane it cannot be advanced to the onset of knock. The calibration range is insufficient. To take full advantage of E85's 97-98 octane would require a higher compression ratio which would cause a deterioration of performance when operating on gasoline.

(Page 5-6): The report states FFV's must be certified to operate on any mixture of ethanol and gasoline. The certification process employs E10, E20 and E85 only, although this is deemed to cover all blend ratios.

Also under ethanol products (second paragraph) it is stated that the energy bill requires "7 billion gallons of ethanol..... by 2020". This should be 7.5 billion gallons of renewable fuel by 2012.

(Page 5-8 and 5-9): The description of the distribution infrastructure seems inadequate. Ethanol is shipped to California, mostly by unit train. It is stored at hub (distribution) terminals where product is then delivered to outlying terminals, usually by truck. The report is correct that delivery to outlying terminals will be by truck as will shipments from instate production. However, the vast majority of ethanol comes to California by train. Some product, mostly imports, arrives by marine cargo. Similarly, the E85 fuel station infrastructure write up could benefit from some expansion. For instance, information on the cost of conversions versus new installations.

(Page 5-11): While volume of a product is usually deemed important, the decision to install equipment to dispense E85, is largely an issue of return on investment. For instance a station selling 20,000 gallons of E85 per month will move 240,000 gallons per year. If the gross margin is 10cpg this is \$24,000 gross margin per year. This is more than adequate to cover the ROI on a \$60,000 “new install” investment. This is especially true given the installions will generate an \$18,000 tax credit under EPACT 2005. Some would disagree that a 5-10% retail station population offering E85 would be sufficient. While 5% - 10% penetration might be acceptable for dedicated alternative fuel vehicles (e.g. CNG, hydrogen) owners of FFV’s have the option of purchasing gasoline and would therefore not normally go out of their way to purchase E85. A number closer to 20% of the station population is more of an industry consensus number. In order to achieve any degree of sales, purchasing E85 must be as convenient as purchasing gasoline so anything less than 20% retail penetration is probably insufficient in most cases.

(Page 5-16): E85 blended at plants is typically blended with natural gasoline instead of finished gasoline. This is the product plants typically use as denaturant. It allows the E85 blends to provide better volatility adjustments at a lower cost than using gasoline. It should be noted that terminal blending of E85 is not presently feasible in California. The gasoline available at terminals, to make up the 15% hydrocarbon portion of E85, is typically CaRBOB. This fuel has a vapor pressure of ~ 5.5 psi which is insufficient to provide adequate pressurization for E85 to reach the minimum ASTM volatility standard. In California E85 would currently need to be blended with isopentane, or another pressurizing agent, which is not typically available at distribution terminals since it is stored under pressure. This may require E85 to be blended only at certain locations (e.g. refineries, specific terminals).

Also, local production may not be a factor in decisions to blend E85. Ethanol is a nationally distributed product and rapidly becoming a global product. If the market is “long” due to over production anywhere in the U.S., the incentive may develop to blend E85. In fact this situation would almost be a necessity absent E85 specific incentives.

Section 6: Alternative Diesel Fuels

(Page 6-1): It is unclear that all the Ediesel additive chemistry is based on “a fatty – acid based stabilizing agent”. This should be confirmed if it is deemed important. Also at present only one company is actually marketing an Ediesel additive.

(Page 6-3 and 6-4): The Ediesel stabilizing additives make no significant contribution to the energy content of the fuel.

Also in referencing that the “vehicle fuel tanks are flammable” it should be clarified here that what is meant is that the vapors in the head space of the tank are in a flammability range that would allow them to ignite given a source of ignition. This could lead to an explosion or fire.

Section 7: Hydrogen

Sources of hydrogen discussed include methane, natural gas and water (via electrolysis). It should be noted that ethanol can also play a role as a hydrogen source. In fact, a report commissioned by the California Fuel Cell Partnership ⁽¹⁾ addresses ethanol as a hydrogen source with some detail. Moreover, the Renewable Fuels Association has a fuel cell and hydrogen platform task group currently exploring different demonstration projects.

Comments on Full Fuel Cycle Analysis Assessment (Power Points):

A set of Power Points describing TIAX’s efforts on the Full Fuel Cycle Analysis Assessment” has been provided, although the actual completed assessment is not yet available.

As noted in the presentation slides, plant energy and agricultural inputs can have a significant impact. While RFA believes the GREET model is the best source for such an assessment it should also be noted that these inputs for ethanol production are constantly and rapidly changing. Improvements in both plant processing and agricultural processes continue to improve at a very rapid pace. The final assessment should include the most current data. To aid in this effort we would suggest that a line item list of all ethanol

related inputs be provided to the ethanol industry for review and comment. The RFA realizes that these efforts are on a very tight time line but believes such a review would add to the accuracy of the assessment.

Comments on Transcript of October 16, 2006 Joint Workshop:

On pages 56-58 of the transcript there is a discussion on E85 including the impact based on in-state production, number of vehicles per station and other issues (this is also discussed on page 216-217). Again, RFA would reiterate that an eventual E85 outlet count approaching 20% of the station population would likely be necessary to adequately serve the market for the aforementioned reasons.

The development of a successful E85 infrastructure will require a very detailed plan. The RFA would encourage the CEC's "Ethanol Working Group" to develop such a plan and solicit a review of any such plan by the ethanol industry, the auto and petroleum industries and others that would be on the front lines of E85 infrastructure development.

Closure:

It is encouraging to see California, through its Energy Commission and Air Resources Board, take a leadership role on the replacement of fossil fuels. The RFA stands ready to assist in this important effort in any manner possible.

